

# Canned Tuna Mercury Levels and Consumption Patterns in Washington State

Jim VanDerslice, Helen Murphy,  
Glen Patrick, David McBride  
Washington State Department of Health

Stuart Magoon, Department of Ecology

National Forum on Contaminants in Fish  
January 26, 2004



## Background

### # Lake Whatcom study

- Compared lake bass to other fish species
- Combined with consumption rates from survey
- Hg intake from canned tuna much higher

### # Issued consumption advisory for tuna May, 2001

- Based on values by Yess, 1993 (170 ppb)
- Provided weight specific consumption advice
- Targeted women of child-bearing age, young kids

### # Tuna consumption on 2002 BRFSS

### # Hg tissue data old, insufficient data on white vs. light

## Tuna Sampling Objective

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### # Estimate mean Hg levels for each 'type'

- Species: Albacore (white) vs. light
- Cut: Solid vs. chunk
- Packing: Water vs. oil

### # Probability sample of 6 oz. cans of tuna available for retail purchase during September-October 2003

- Excluded flavored tuna, tuna packed in oils other than vegetable oil, low sodium preparations, etc...

### # Target: 40 cans / type (min detectable diff = 85 ppb)

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## Selecting Stores

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### # Primary Sampling Unit: Retail Outlets

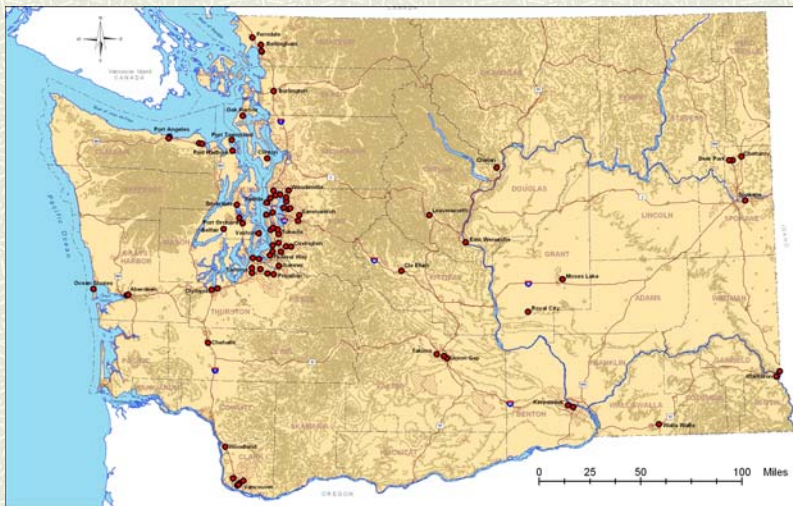
### # Obtained listing of all food outlets

- Amount of food sales (\$)
- Used as proxy for sales of canned tuna

### # Randomly selected stores

- Probability of selection proportional to sales
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## Store Locations



## Types of Canned Tuna

Species	Cut	Packing	Type
White (albacore)	Chunk	Oil	<b>WCO</b>
		Water	WCW
	Solid	Oil	WSO
		Water	WSW
Light	Chunk	Oil	LCO
		Water	LCW
	Solid	Oil	LSO
		Water	LSW



## Stratified Sample by Type

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- # Choose left-hand can on top row
- # Select one for each type and brand
- # Sort by type
- # Randomly select one can from each type



## Lab Analysis

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- # Conducted by WA Department of Ecology Manchester Environmental Lab
- # Analyzed for total Hg, using EPA method 245.5

## Sampling Results

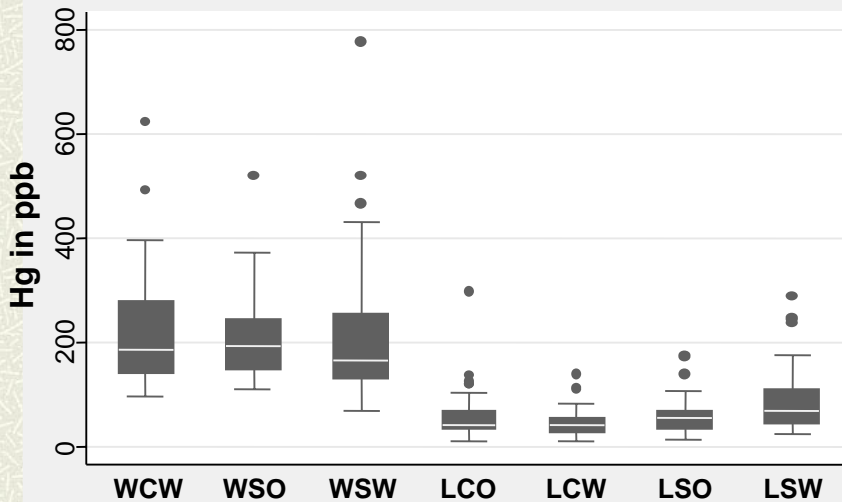
Type	N	# stores	Availability	Ave # brands
WCW	44	57	77%	2.2
WSO	42	83	51%	1.2
WSW	44	46	96%	3.4
LCO	45	55	82%	2.2
LCW	44	46	96%	3.9
LSO	28	83	34%	1.2
LSW	42	83	51%	1.0

**Total of 289 cans sampled**

## Tuna Brands

Brand	#	%
Star Kist	123	43%
Bumble Bee	99	34%
Chicken of the Sea	26	9%
All other brands	41	14%

## Hg Concentrations, by Type



## Linear Regression Results



Factor	Parameter Estimate	Std. Err.	t	P> t
White	151.3	11.3	13.3	<0.001
Solid	15.8	12.7	1.2	0.22
Water	-5.2	9.3	-0.6	0.58
constant	56.8	8	7.1	<0.001

Hg levels in white tuna was, on average, 151 ppb higher than light.

Other factors were not associated with Hg levels.

# Canned Tuna Hg Concentrations



	<b>Mean*</b> <b>(ppb)</b>	<b>95% CI</b>
White	214.5	191.3 - 237.8
Light	57.1	50.9 - 63.3

\* - Weighted means

# Canned Tuna Consumption



## # BRFSS 2002

- Nationwide probability-sample telephone survey

## # Questions:

- "How often do you eat canned tuna?"
- "When you eat canned tuna, about how much of a standard 6 oz. can do you eat at a sitting?"

## # Randomly-chosen adult

**Randomly-chosen child under 5**

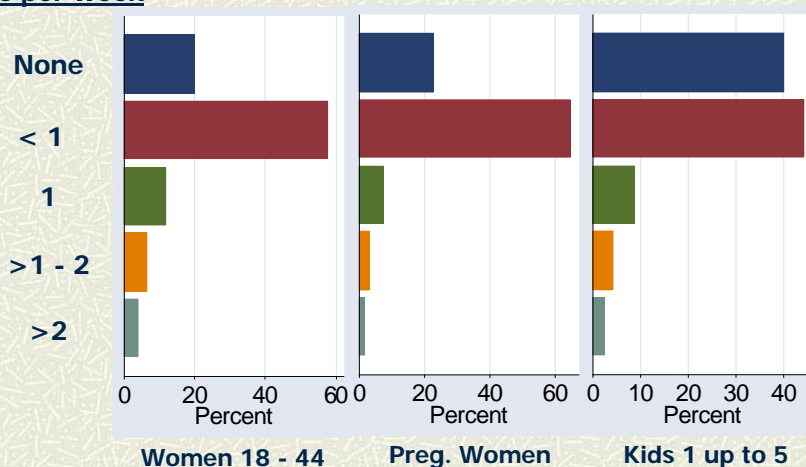


## WA BRFSS 2002 Sample

# Adult men	1,968
# Adult women	2,919
# Women 18 to 44	1,300
# Pregnant women	61
# Kids 1 up to 5	491

## "How often do you eat canned tuna?"

### Times per week

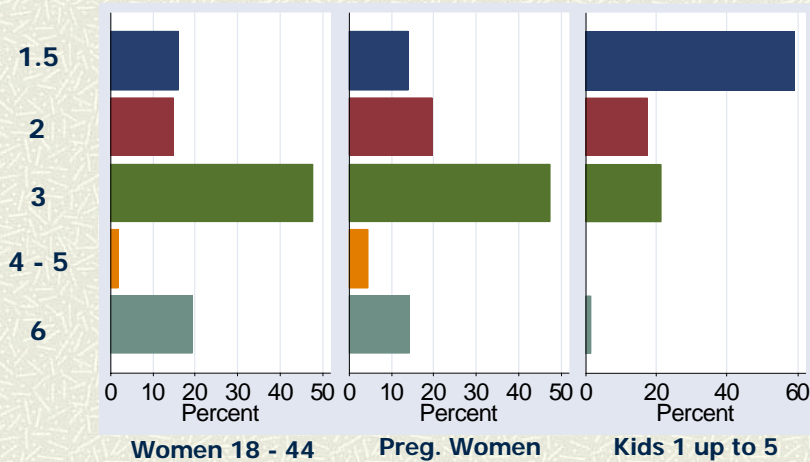




## "How much ... tuna do you eat at a sitting?"



### Oz. per meal



## Predicted Hg Dose ( $\mu\text{g}/\text{Kg day}$ )



Tuna	Dose	Women 18 - 44	Pregnant women	Kids 1 up to 5
White	95th %-tile	0.095	0.07	0.17
	% > RfD	4.6%	1.9%	10.7%
Light	95th %-tile	0.03	0.02	0.05
	% > RfD	0.4%	0.0%	2.2%

## Next Steps

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- # **Combine data and examine differences between studies**
  - # **Conduct 2<sup>nd</sup> round of sampling in WA (pending funding)**
  - # **Consult with other states and consider revising current tuna consumption advisory**
  - # **2004 BRFSS consumption questions**
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## Acknowledgements

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- # **The 2002 BRFSS data collection was funded by WA DOH**
  - # **The Canned Tuna Hg Study was funded through the Washington Environmental Public Health Tracking Network grant from the National Centers for Environmental Health, CDC (U50/CCU022438-01)**
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